Work Order ID 85388  June-07-12 9:25:55:AM	*85	388*			Page 1
Item ID: D412-664-203TRN Revision ID: Item Name: Crosstube Turning Detail Start Date: 07/06/2012 Start Qty: 1.0	1.0	*N9000401	I	Setup Start Stop	*NS1* *NS2*
Required Date: 21/06/2012 Req'd Qty: 1.0 Reference:	*1*	Customer:			
Approvals: Process Plan: MLJ  QC:	Date: 12/06/07 Tooling: Date: SPC (Y/N):	Date:		Run Start Stop	*NR1* *NR2*
Sequence ID/. Operation Work Center ID Description	Set Up/ Run Hours	Tool ID Tool # F	Plan Ac		Reject Insp. Number Stamp
Draw Nbr Revision Nbr	1			A STATE OF THE STA	- Stamp
D412-664-243 Rev E(DEO)	-				r
*100  *100  MORI SEIKI CNC  Mori Seiki  Memo				10	***************************************
Mori Seiki CNC Lathe Large 1-Fill t 2-Turn 3- File	ube with sand & install plugs DT8534 on both ends as first side as per Folio FA166 transition lines smooth.  REV:	s per Folio FA166		·	12/06
110 QC1- Inspect dimer	nsions to dimension sheet 0.00				
*110* QC Memo	0.00	(4)		L _Ø	· · · · · · · · · · · · · · · · · · ·

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W/O:			WC	RK ORD	ER CHANC	BES				,	*
DATE	STEP	PRO	OCEDURE CHAI	NGE			Ву	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector
Part No		PAR #:		1							
	R	esolution:	Disposition	n: <u></u>		QA:	N/C CI	osed:		Date: _	
NCR:			WORK ORD	ER NON-	CONFORM	ANCE	(NCF	R)			
		Description of NC		Corrective	Action Sec	tion B		Vorifi	cation	Annuarat	Approval
DATE	STEP	Section A	Initial Chief Eng	Actio	n Description Chief Eng		Sign 8 Date		ion C	Approval Chief Eng	QC Inspector
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Quality Control

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<b>√</b> 10:		WORK ORDER CHANGES									
DATE	STEP	PROCEDURE CHA	Ву	Date	Qty	Approval Chief Eng / Prod Mgr	Approva QC Inspector				
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Part No:		PAR #:	_ Fault Category:	NCR: Yes	No DQA:	Date: _	
	Re	solution:	_ Disposition:	QA: N/C Clo	sed:	Date: _	
NCR:		W	ORK ORDER NON-CON				
		Description of NC	Corrective Action	Section B	Varidication		A 122
DATE	STEP	Section A	Initial Action Desc Chief Eng Chief En		Verification Section C	Approval Chief Eng	Approva QC Inspect
	1		~				1

DATE STED		Description of NC		· Corrective Action Section B					Verification	Approval	
DATE	STEP	Section A		Initial Chief Eng		Action Description Chief Eng		Sign & Date	Section C	Approval Chief Eng	QC Inspector
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**WORK ORDER NON-CONFORMANCE / UPDATE** NCR: No Date: QA Closed: DISPOSITION **AGAINST DEPARTMENT/PROCESS** Work Order: Rework Skid-tube Crosstube 🗸 Prod. Eng. Coor. Engineering Part No. D412-664-203TEN Scrap Machining Small Fab Rec/Store/Packaging Quality Use-as-is ✓ Thermoforming Finishing Supplier NCR No. Work Order Update Large Fab Composite Other Description of work order update Root Initial Action Sign & Chief Eng Cause Date Step Qtv or Non-conformance Description Date Verification QC Inspector Doc/Data 130 PART WAS INSPECTED PER QSI-12/06/22 Equip/Tooling Hecephble. 038 BUT WAS UNABLE TO Operator REGORD DIMENSON REDUIZED READING 4 15 on RAW MATIL & DAW MATIL 15 Material ON INSPECTION SHEET FOR Offset/Setup READING 4 ON FAI INSPECTION Other SHEET. POSSIBLE DINENSIONS Process BRE PART OF RECEIVING Supplier REPORT Training Unaut

utnorizea							` ()			
					FAU	LT CATEGORY	7	The same		<del> </del>
Landi	ng (	Gear		Hardware		General	U			
		Bending Passes Below Min		Breaking		Burrs		Maintenance		Set-up
		Centre Not Concentric to O/S		Missing		Contamination		Mislabeled		Supplier
		Cracks		Size/Length		Cut Too Short		Off-Set		Temperature/Cure
		Crushed/Crimp at Bending	L	Spinning		Documentation/Data		Orientation Misread		Weld
		Inspection Strip in Tube		Threading		Finish		Out of Calibration		Wrong Stock Pulled
		Other	L	Wrong	$\times$	Inspection Incomplete		Out of Sequence		
-		Positioned Wrong		Drill Holes		Inspection Unqualified		Outside Dimensions		Other
		Ripples on Inner Bend	L	Misaligned		Instructions Incomplete/Unclear		Over/Under tolerance	•	
p.		Torque Waves in Extrusion		Ovalized		Jigs/Fixtures/Tooling		Part Lost		
And the second		Turning Sequence		Over/Undersized		Kit Incorrect		Part Moved	-	
		Wave/Twist in Tube		Too Many		Kit Missing		Raw Material	********	

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Quality Control

QC7-Inspect Chemical Conversion Coat

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W/O:				1	WORK ORDER C	HANGES				, ,	, ,
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Part No	:		PAR #:	Fault Ca	ategory:	NC	R: Yes	No DQ	A:	_ Date: _	
	R	esolution		Disposi	tion:	QA	: N/C (	Closed:		Date: _	
NCR:			•	WORK OF	DER NON-CON	ORMANCI	E (NC	R)			
DATE	OTED		escription of NC		Corrective Action			Verifi	cation	Approval	Approval
DATE	STEP		Section A	Initial Chief Eng	Action Desc Chief En		Sign Date	& Sec	tion C	Chief Eng	QC Inspector
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Quality Control

QC

Page 4

June-07-12 9:25:55 AM Item ID: D412-664-203TRN Accept \*N900040100\* Setup Start **Revision ID:** Item Name: Crosstube Turning Detail **Start Date:** 07/06/2012 Start Oty: 1.00 Cust Item ID: **Required Date:** 21/06/2012 Req'd Qty: 1.00 **Customer:** Reference: Run Approvals: **Process Plan:** Date: **Tooling:** Date: Date: SPC (Y/N): Date: Sequence ID/ Operation Set Up/ Tool ID Tool # Plan Accept Reject Reject Insp. Work Center ID Description **Run Hours** Code Qty Qty Number Stamp 170 0.00 Packaging \*170\* Packaging 0.00 Memo Packaging Identify and stock in kanban rack Location: ( 180 QC21- Final Inspection - Work Order Release 0.00

0.00

Memo

	Johane									
W/O:			WORK ORDER CHANGES  PROCEDURE CHANGE  By Date Qty Approval Chief Eng / Prod Mgr / OCC Inappector  Prod Mgr / Prod Mgr / OCC Inappector  NCR: Yes No DQA: Date:  Disposition: QA: N/C Closed: Date:  WORK ORDER NON-CONFORMANCE (NCR)  Tription of NC Corrective Action Section B Section C Chief Eng Chief							
Part No:PAR #: Fault Category:  Resolution:Disposition:  NCR: WORK ORDER NON-CONFORM  DATE STEP Description of NC Section A Corrective Action Description D	IANGE	By	,	Date	Qty	Chief Eng /				
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Part No	:	PAR #:	Fault Ca	tegory:	_ NCR: Y	es N	o <b>DQ</b>	A:	Date: _	
	Resolution:						Date: _	<del></del>		
NCR:	•	\	WORK OR	DER NON-CONFORM	ANCE (N	CR)				
DATE	STEP	Description of NC				Verific	cation	Approval	Approval	
- JAIL	OIL.	Section A		Action Description Chief Eng	SI	gn & ate	Secti	on C		QC inspector
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# Picklist Print

June-07-12 9:25:58 AM

Work Order ID: 85388

D412-664-203TRN Parent Item:

Parent Item Name: Crosstube Turning Detail

\*85388\*

\*D412-664-203TRN\*

Start Date: 07/06/2012

**Required Date:** 21/06/2012

Page 1

Start Qty: 1.00

Required Qty: 1.00

Comments:

IPP Rev:A 08-03-06 new issue DD verified by:eec

IPP Rev B 08.04.02 Removed polish EC verified by: DD

Comp Item N	onent Item ID/ Name	Replacement Item ID	Mfg/ Purch	Bin Item	Primary Location	Last Location	Route Seq ID	Unit of Measure	Qty on Hand	Qty per Kit	Total Qty	Qty Issued	Date Issued	Status
D6009	129		Manufactured	No			120	Each	23.0000	1	1			
**	2000 45	)O*								ملدمله				

1)6009-179

Crosstube Material

<u>Location</u>	Loc Qty	Loc Code	
LG	23		
(69801)	23		
	To the second se		-1

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Dait Ac	ospace	LU							
W/O:			W	ORK ORDER CHANGE	S			,	,
DATE	STEP	PRO	OCEDURE CHA	NGE	Ву	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector
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Part No	:	PAR #:	Fault Cate	gory:	NCR: Yes	No DQA	۸:	_ Date: _	·
	R	esolution:	Dispositio	n:	QA: N/C Clo	sed:		Date: _	
NCR:			WORK ORD	ER NON-CONFORMA	NCE (NCR)				
6477	0.750	Description of NC		Corrective Action Section		Verific	ation	Approval	Approval
DATE	STEP	Section A	Initial Chief Eng	Action Description Chief Eng	Sign & Date	Section		Chief Eng	QC Inspector
					;				
				•					
							<del></del>		

DART AEROSPACE LTD	Work Order:	85388
Description: Crosstube Assembly (412 High Aft)	Part Number:	D412-664-243
Inspection Dwg: D412-664-243 Rev: E		Page 1 of 1

# FIRST ARTICLE INSPECTION CHECKLIST

X	First Article	Γ	Prototype
		. L.	

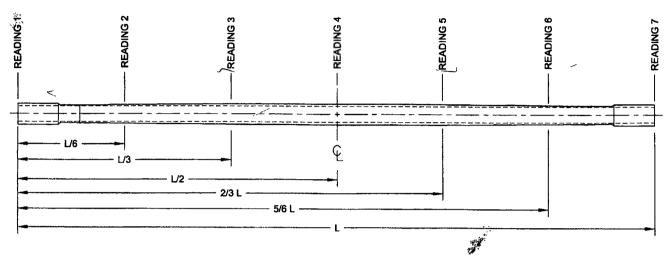
	nspection Sheet awing Dimension	Tolerance	Actual	Accept	Reject	Method of	Comments
016			Dimension	<u> </u>		Inspection	
	2.684	+0.005/-0.000	2.686			vern	CNC-08
	2.748	+0.005/-0.000	2.750				
	2.884	+0.005/-0.000	2.888				
	3.019	+0.005/-0.000	3.0,22				
Ì	3.163	+0.005/-0.000	3.164				
	3.308	+0.005/-0.000	3.312				
A	3.429	+0.005/-0.000	3.430				111
SIDE	2.990	+0.005/-0.000	2.990				
S	2.618	+0.005/-0.000	2-623	/		7	
	0.200	+/-0.010	200			vern	CNC-OK
	R0.063	+/-0.010	,063			RO	
	R0.500	+/-0.010	150V			11	
	4.971	+/-0.030	4.971			vern	CNC-08
	2.684	+0.005/-0.000	2.686			vern	CNC-08
	2.748	+0.005/-0.000	2.749			)	
	2.884	+0.005/-0.000	2-887				
	3.019	+0.005/-0.000	3.021				
	3.163	+0.005/-0.000	3.165				
	3.308	+0.005/-0.000	3.312				
œ l	3.429	+0.005/-0.000	3-429				
SIDE	2.990	+0.005/-0.000	2.991				
S	2.618	+0.005/-0.000	2.622			U	
	0.200	+/-0.010	.200			vern	CNC-05
ļ	R0.063	+/-0.010	.083			RO	<u> </u>
	R0.500	+/-0.010	.500	/		1,	
ľ	4.971	+/-0.030	11.971	/ /		vern	CWC-08
	124.100	+/-0.020	124.100	4	1	tape	CNC-08 66-25

Measured by: 9797, U	Audited by:		Prototype Approval:	N/A
Date: 12/06/16	Date:	12-6-18	Date:	N/A

Rev	<u>Da</u> te	Change	Revised by Approved
Α	04.06.16	New Issue (P/O D412-664-203)	KJ/JLM
В	06.03.09	Dwg Rev updated	KJ/JLM
U	07.05.08	Tolerance updated for dimension 4.971	KJ/JLM
D	10.02.02	Dimension 124.100 was 124.09	KJ KJ

DART AEROSPACE LTD	Work Order:	
Description: Crosstube Assembly (412 High Aft)	Dort Number	D442 CC4 2423
Description. Crosstabe Assembly (412 High Ait)	Part Number:	D412-664-243
Inspection Dwg: D412-664-243 Rev: E		* Page 2 of 2

# **WALL THICKNESS MEASUREMENT**



		WALL	THICKNESS I	MEASUREMEN	NT (IN)	Deviation	
i	Location	w1	w2	w3	w4	Δw (max-min)	TOLERANCE
	READING 1 L= 0"	.379	,375	.382	-364	.018	
_	READING 2 L= VO	.310	.302	.313	.326	,024	
,	READING 3 L= 40	.497	,477	,459	, 488	038	
	READING 4 L=	Cany	measure,	ox and	6/27		0.073"
	READING 5 L= 40	.483	.470	.470	.492	022	
	READING 6 L= 20	.302	,313	.328	-315	026	
	READING 7 L=	-376	.372	- 365	, 381	.014	

## **Calibration Result**

Actual Block Thickness: 100-550

Sitescan 250 Measured Thickness: 100-500

Measured by: KC

Date: 17-6-20

Audited by: Preliminary Approval:

Date: 2-6-18

Date: 12-6-18

Date	Change	Revised by	Approved
04.06.16	New Issue (P/O D412-664-203)	KJ/JLM	1
06.03.09	Dwg Rev updated	KJ/JLM	
07.05:08	Tolerance updated for dimension 4.971	KJ/JLM	
10.02.02	Dimension 124.100 was 124.09	KJ 🔥	11
12.06.04	Wall thickness form added	KJ OL	/iX
	04.06.16 06.03.09 07.05:08 10.02.02	04.06.16 New Issue (P/O D412-664-203) 06.03.09 Dwg Rev updated 07.05:08 Tolerance updated for dimension 4.971 10.02.02 Dimension 124.100 was 124.09	04.06.16         New Issue         (P/O D412-664-203)         KJ/JLM           06.03.09         Dwg Rev updated         KJ/JLM           07.05:08         Tolerance updated for dimension 4.971         KJ/JLM           10.02.02         Dimension 124.100 was 124.09         KJ

Item	Qty -243	Part Number	Description
1	х	D412-664-243	CROSSTUBE ASSEMBLY (412 HIGH AFT)
2	. 1	D6009-129	CROSSTUBE
3	2	D3595-063-570	RUBBER CUSHION
4	1	D2896-1	SUPPORT
- 5	2	D3189-1	CHAFING SHIELD
6	2	D2856-600-1009	ABRASION STRIP
7	4	MS21920-28	CLAMP
8	2	MS21920-30	CLAMP (OR MS21920-32)
9	A/R	MAGNOBOND 6398	ROCKWELL SPECIFICATION RBO-120-023 ADHESIVE (TEXTROWBELL SPEC. 299-947-100, TYPE II. CLASS 2 ADHESIVE)

SHOP COPY RETURN TO ENGINEERING UNCONTROLLED COPY SUBJECT TO AMENDMENT WITHOUT NOTICE WORK ORDER MLJ NO 85388 MLJ 12/06/07

#### **GENERAL NOTES:**

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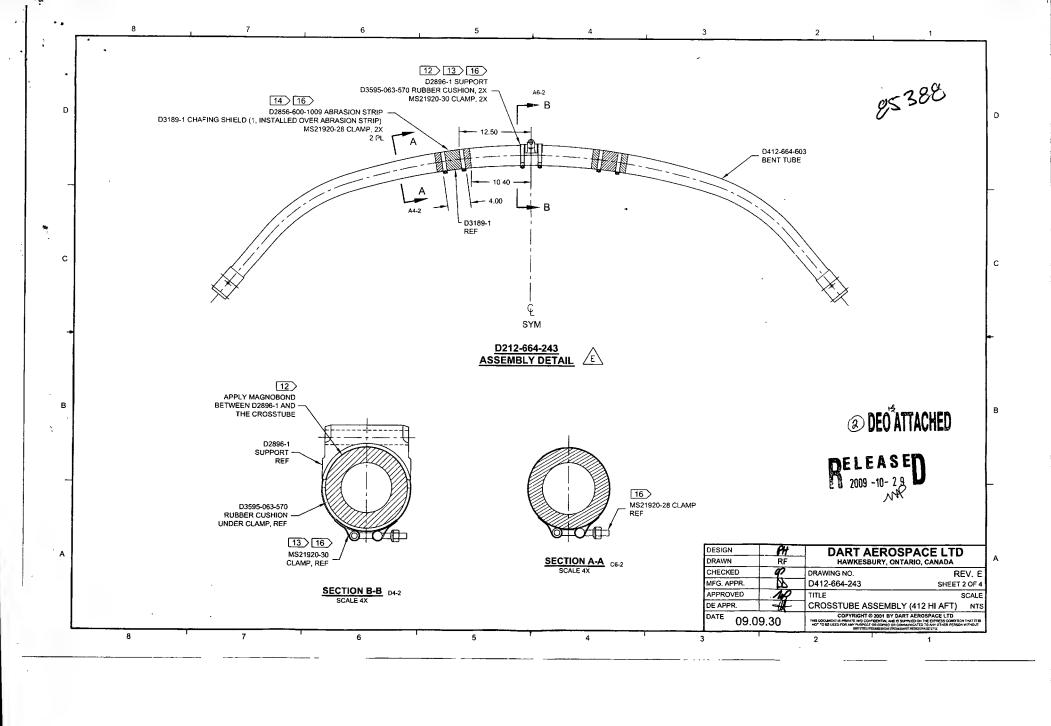
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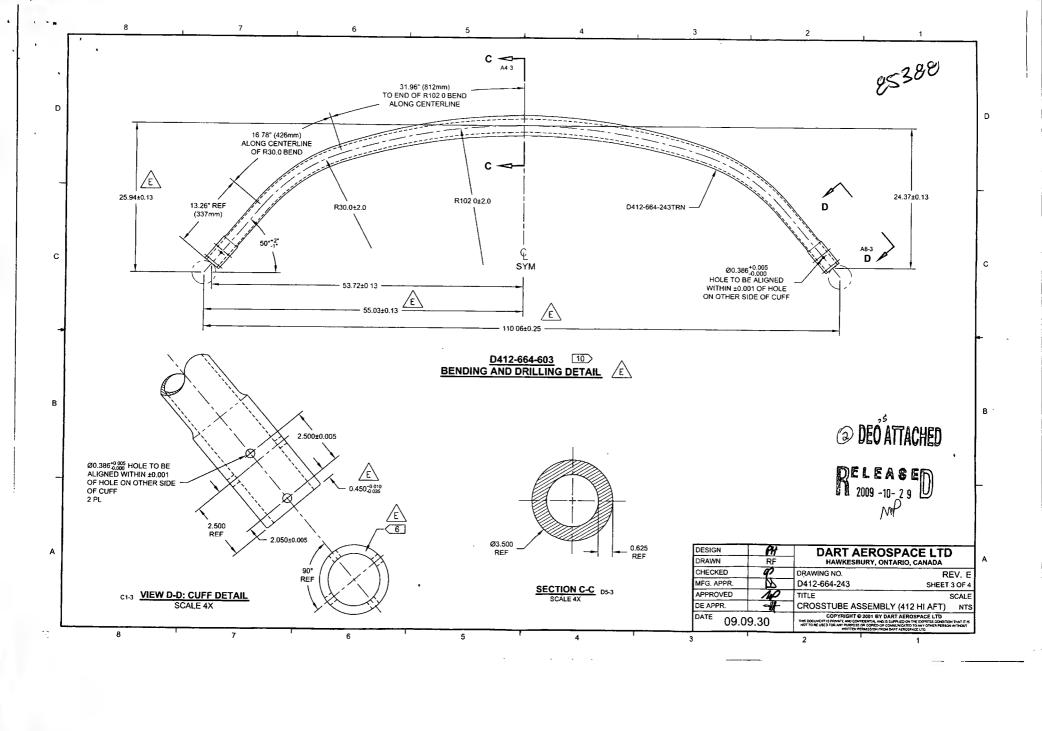
- 1) MATERIAL: MANUFACTURED FROM D6009-129
- FINISHED LENGTH = 124 100±0.020 (BEFORE BENDING/TRIMMING) FINISH: CHEMICAL CONVERSION COAT PER DART QSI 005 4.1
  - PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2 PAINT OUTSIDE PER DART QSI 005 4.2
- 3) TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED.
- UNITS: INCHES UNLESS OTHERWISE NOTED.
- BREAK SHARP EDGES 0.005 TO 0.010 MAX.
- IDENTIFICATION: SCRIBE DART PART NUMBER "D412-664-243" AND BATCH NUMBER ON INSIDE OF CUFF USING VIBRATING STYLUS.
- WEIGHT: 47.0 lbs (PER IIN-D212-664)
- PART IS SYMMETRIC ABOUT CENTERLINE.
- RUN CUTTER OFF PART. BLEND OUT EDGE LONGITUDINALY, TRANSITION SHOULD BE SMOOTH.
- 10) BEND PROGRESSIVELY WITH A MINIMUM OF 8 PASSES. MAXIMUM TUBE FLATTENING DUE TO BENDING IS 6% BASED ON O D.
- 11) LIQUID PENETRANT INSPECT OUTSIDE SURFACE OF CROSSTUBE PER QSI 038
- 12) INSTALL D2896-1 SUPPORT USING 0.03" TO 0.06" THICK LAYER OF MAGNOBOND 6398 TO THE SURFACE OF D2896-1 THAT WILL BE IN CONTACT WITH THE CROSSTUBE PER QSI 015. LET CURE FOR 12 HOURS AFTER INSTALLATION AND PRIOR TO PACKAGING.
- 13) INSTALL MS21920-30 CLAMPS (OR -32) WITH D3595-063-570 RUBBER CUSHIONS TO SECURE THE D2896-1 SUPPORT ON TOP SIDE OF THE CROSSTUBE. ENSURE CLAMPS ARE OPPOSITE OF CROSSTUBE SUPPORT.
- 14) INSTALL D2856-600-1009 ABRASION STRIPS WITH A 0.13 REF GAP ON BOTTOM SIDE OF CROSSTUBE PER QSI 035.
- 15) EXTREME CARE MUST BE TAKEN TO PROTECT THE OUTSIDE SURFACE OF THE TUBE. THE OUTSIDE SURFACE MUST BE SMOOTH AND FREE FROM SURFACE DEFECTS SUCH AS SCRATCHES, NICKS, OR DENTS. DEFECTS UP TO 0 005" MAY BE BLENDED OUT LONGITUDINALLY. CIRCUMFERENTIAL GRIND MARKS ARE UNACCEPTABLE.
- 16) TORQUE CLAMPS 80 TO 100 IN-LB. ENSURE AT LEAST 1.5 THREADS SHOWING IN SAFETY AND THAT NUT HAS NOT BOTTOMED-OUT AFTER TORQUING.

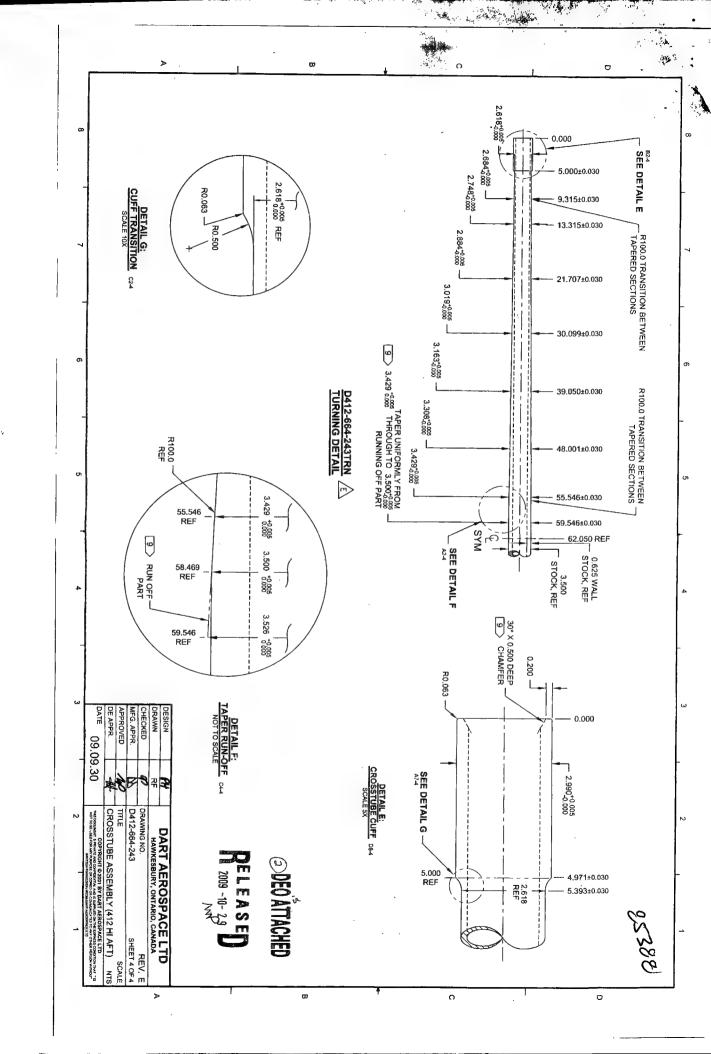
@ DEO'ATTACHED

В

E	TO CUI PAR 08 C8-3 &	MAT/REVISE ( SANIZED VIEW RRENT STAND -046 (ZN A6-3) C5-3); MOVED ANCE TO SHE	, RF	09.09.30		
D	REMO	VE D2732-058	3, CHANGE TO D3595-063-570	PH	07.03.09	
υ			0-1087, ADD D2732-058 & MS21920-32 WAS MS21920-30	МВ	06.10.27	
В	ADD H SKIDT		OMPATABILITY WITH BHT/AA	PH	05.02.04	
Α	NEW IS	SSUE	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	PH	01.10.17	
REV.			DESCRIPTION		DATE	
DESIGN	DESIGN PH		DART AEROSP	ACE	LTD	
DRAWN	DRAWN RF		HAWKESBURY, ONTAR			
CHECK	D	P	DRAWING NO.		REV. E	
MFG. APPR.		177	D412-664-243	664-243 SHEET 1 OF 4		
APPROVED 10		140	TITLE SC		SCALE	
DE APPI	R.	-#	CROSSTUBE ASSEMBLY (	412 HI A	AFT) NTS	
DATE	09.0	9.30	COPYRIGHT © 2001 BY DART AT THIS DOCUMENT IS PRIVATE AND COMPONENTIAL AND IS SUPPLE			







DRAWING NO. D412-664-243	TITLE CROSSTUBE ASSEMBLY			.O. NO. 12-664-243-E-1	SHEET NO. SHEET 1 OF 2	SCALE
DRAWN	S CHECKED	MFG. APPR.	Z APPRO		DE APPR.	NTS
DATE 11.03	3.31 DATE 11/	03.31 DATE ,	17.03.31 DATE	11/00 2 1	DATE 11-03.31	

**PURPOSE:** 

REMOVED ABRASION STRIP IN FAVOR OF A THIN LAYER OF PROSEAL 890.

25328

### CHANGE:

#### PARTS LIST IS AMENDED AS FOLLOWS:

## <u>IS:</u>

Item	Qty -243	Part Number	Description
6	0	D2856-600-1009	ABRASION STRIP

#### WAS:

	L	l	
6	2	D2856-600-1009	ABRASION STRIP

## NOTES 2 AND 14, SHEET 1 ARE AMENDED AS FOLLOWS:

#### IS:

2) FINISH: CHEMICAL CONVERSION COAT PER DART QSI 005 4.1 PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2

MASK UNDERSIDE OF CROSSTUBE AS SHOWN (HATCHED AREA)

PAINT OUTSIDE PER DART QSI 005 4.2

AFTER PAINTING, APPLY CLEAR COAT ON HATCHED AREA

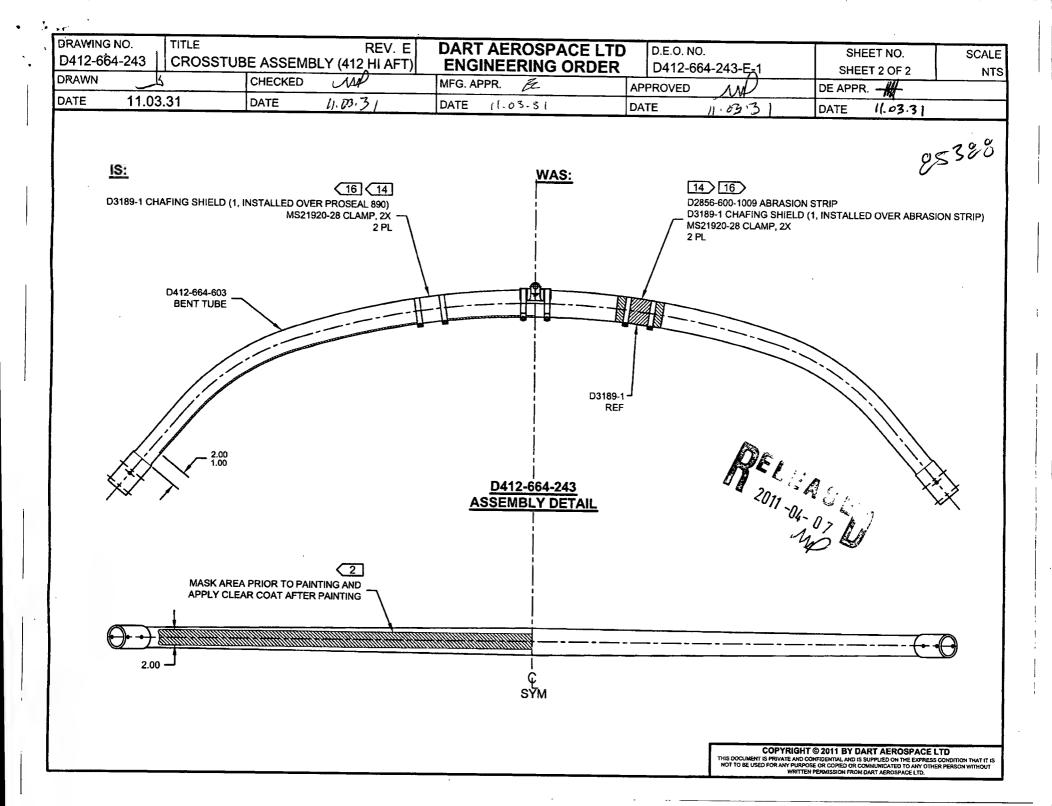
14) APPLY A THIN COAT OF PROSEAL 890 ON INSIDE CONCAVE SURFACE OF D3189-1 CHAFING SHIELD AND LET CURE PER MANUFACTURER'S INSTRUCTIONS. INSTALL PROSEALED D3189-1 CHAFING SHIELD ONTO CROSSTUBE BY APPLYING A THIN COAT OF PROSEAL 890 ONTO CROSSTUBE. BE SURE TO ELIMINATE ANY AIR GAPS.

## WAS:

2) FINISH: CHEMICAL CONVERSION COAT PER DART QSI 005 4.1 PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2 PAINT OUTSIDE PER DART QSI 005 4.2

14) INSTALL D2856-600-1009 ABRASION STRIPS WITH A 0.13 REF GAP ON BOTTOM SIDE OF CROSSTUBE PER QSI 035.





DRAWII	NG NO. TITI	.E	REV. E	DART AEROSPACE LT	DEC NO:	0	
D440	664 949 00	ODOTUBE AGONA				SHEET NO.	SCALE
		OSSTUBE ASS'Y (	412 HI AFT)	ENGINEERING ORDER	D412-664-243-E-2	SHEET 1 OF 1	NTS
DRAWN	ı q	CHECKED	ASS	MFG. APPR.	APPROVED M	DE APPR.	
DATE	11.09.07	DATE	11.09.19	DATE ((.09.19	DATE 11.09.19	DATE 11.09.19	

**PURPOSE:** 

REPLACE MAGNOBOND WITH 3M DP460 SCOTCH-WELD EPOXY ADHESIVE

98329

#### CHANGE:

IS:

Item	Qty -243	Part Number	Description
9	A/R	SCOTCH-WELD DP460	EPOYY ADHESIVE 2M SCOTCH MELD
9	7/7	SCOTCH-WELD DF400	EPOXY ADHESIVE, 3M SCOTCH-WELD

#### WAS:

9	A/R	MAGNOBOND 6398	ROCKWELL SPECIFICATION RBO-120-023 ADHESIVE (TEXTRON/BELL SPEC. 299-947-100, TYPE II, CLASS 2 ADHESIVE)

NOTE 12 & 16, SHEET 1 IS AMENDED AS FOLLOWS:

IS

- 12) INSTALL D2896-1 CENTER SUPPORT USING A 0.04" TO 0.07" THICK LAYER OF SCOTCH-WELD DP460 PER QSI 015. LET CURE FOR 24 HOURS AFTER INSTALLATION AND PRIOR TO PACKAGING.
- 16) TORQUE CLAMPS 80 TO 100 IN-LB. ENSURE AT LEAST 1.5 THREADS SHOWING IN SAFETY AND THAT NUT HAS NOT BOTTOMED-OUT AFTER TORQUING. PRIOR TO PACKAGING, RE-CHECK TORQUE ON CLAMPS AFTER ADHESIVE HAS CURED FOR 24 HOURS.

#### WAS:

- 12) INSTALL D2896-1 SUPPORT USING 0.03" TO 0.06" THICK LAYER OF MAGNOBOND 6398 TO THE SURFACE OF D2896-1 THAT WILL BE IN CONTACT WITH THE CROSSTUBE PER QSI 015. LET CURE FOR 12 HOURS AFTER INSTALLATION AND PRIOR TO PACKAGING.
- 16) TORQUE CLAMPS 80 TO 100 IN-LB. ENSURE AT LEAST 1.5 THREADS SHOWING IN SAFETY AND THAT NUT HAS NOT BOTTOMED-OUT AFTER TORQUING.



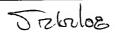
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# **EXTRUSION INSPECTION SHEET**

							<b>ULTRA SONIC MEASURMENTS</b>				<u>rs</u>
TUBE #	TOTAL LENGTH	DIA two readings	INSIDE DIA	wall thickness measured w/vern	Straghtness at 12"	Rockwell Reading	LOCATION on tube	R1	R2	R3	R4
1	129.00"	3.495"/3.492"	2.249"	0.612"/0.625"	0.019"	N/A	middle 64.5"	0.631"	0.631"	0.624"	0.624"
2	129.00"	3.500"/3.495"	2.249"	0.612"/0.641"	0.010"	N/A	middle 64.5"	0.630"	0.621"	0.625"	0.632"
3	129.00"	3.490"/3.498"	2.249"	0.615"/0.635"	0.005"	N/A	middle 64.5"	0.633"	0.638"	0.624"	0.618"
4	129.00"	3.491"/3.496"	2.248"	0.623"/0.632"	N/A	N/A	middle 64.5"	0.638"	0.630"	0.616"	0.625"
5	129.00"	3.498"/3.504"	2.250"	0.615"/0.621"	N/A	N/A	middle 64.5"	0.631"	0.624"	0.624"	0.630"
6	129.00"	3.493"/3.494"	2.249"	0.628"/0.612"	N/A	N/A	middle 64.5"	0.621"	0.623"	0.630"	0.623"
7	129:00"	3.491"/3.493"	2.250"	0.616"/0.630"	N/A	N/A	middle 64.5"	0.625"	0.629"	0.627"	0.627"
8	129.00"	3.495"/3.495"	2.249"	0.625"/0.615"	N/A	N/A	middle 64.5"	0.624"	0.623"	0.627"	0.627"
9	129.00"	3.499"/3.498"	2.250"	0.633"/0.613"	0.008"	N/A	middle 64.5"	0.631"	0.641"	0.621"	0.620"
10	129.00"	3.495"/3.501"	2.251"	0.624"0.618"	N/A	N/A	middle 64.5"	0.619"	0.626"	0.636"	0.637"
11	129.00"	3.497"/3.500"	2.250"	0.625"/0.625"	N/A	N/A	middle 64.5"	0.621"	0.624"	0.632"	0.640"
12	129.00"	3.494"/3.498"	2.252"	0.615"/0.631"	N/A	N/A	middle 64.5"	0.625"	0.629"	0.629"	0.629"
13	129.00"	3.493"3.495"	2.251"	0.621"/0.615"	N/A	N/A	middle 64.5"	0.631"	0.626"	0.623"	0.628"
14	129.00"	3.491"/3.494"	2.250"	0.620"/0.618"	N/A	N/A	middle 64.5"	0.627"	0.621"	0.626"	0.642"
15	129.00"	3.493"/3.501"	2.246"	0.625"/0.628"	N/A	N/A	middle 64.5"	0.627"	0.630"	0.631"	06.26"
PART # [	06009-129	P/O# 14138		<u>BATCH</u> # B69801		Notes:					



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